OPERATION, INSTALLATION, and SERVICE INSTRUCTIONS

for the Sherwood

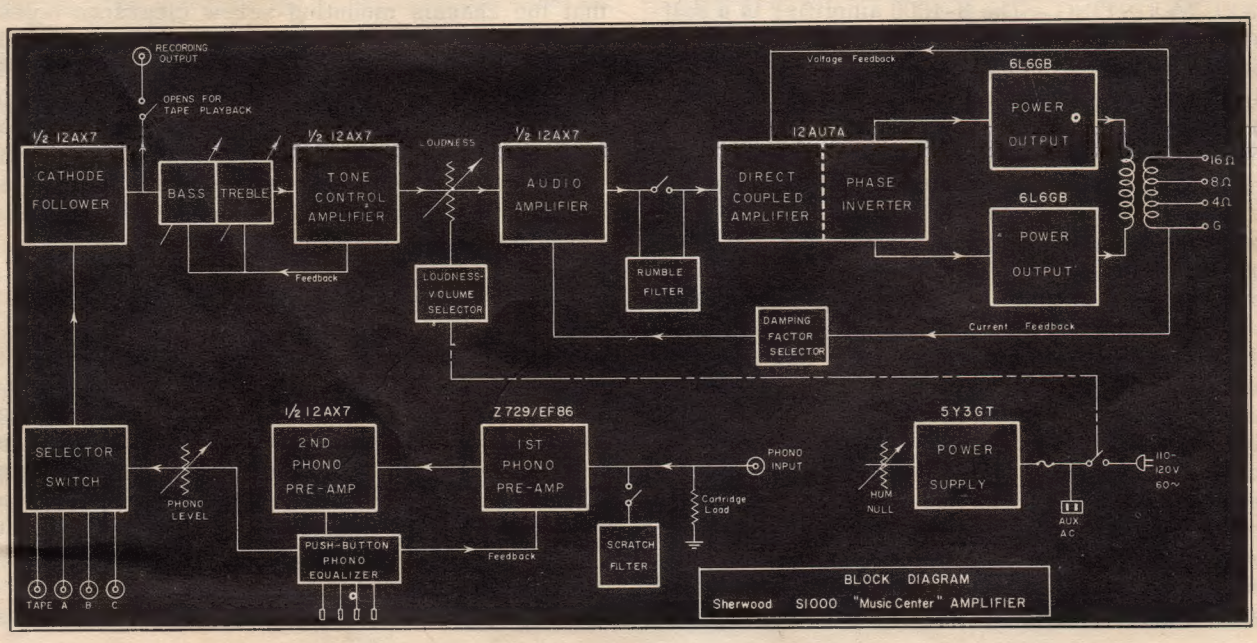
SAM's
S-1000 345-14
S-1000 II 390-10
S-1000 II 441-14 - Revised

S-1000 "MUSIC CENTER" HIGH-FIDELITY AMPLIFIER

105
25 Tube

TECHNICAL DATA

Power Output: 20 watts (40 watts peak) @ 2% IM Distortion (60:7kc/4:1) or ½% harm. distortion.
Load Impedance Taps: 16, 8, and 4 ohms.
Inverse Feedback: 14 db., also selection of Positive or Negative current feedback from speaker.
Damping Factor: 7:1 normal, also 2:1 or minus 2:1.
Power Response: (20w.) 20 cps.—30 kc±1 db.
Frequency Response: (¼w.) 7 cps.—100 kc.±1 db.
Tone Control Response: Flat setting, 20 cps.—20 kc.±½ db.
Tone Control Range: @ 15 kc, 20 db. boost or cut.
@ 40 cps., 16 db. boost, 19 db. cut.
Rumble Filter: @ 27 cps., 12 db. rejection; 100 cps. less than 2 db. down.
Phono Equalizer Curves: LP, AES/RIAA, LONdon, EURopean
Sensitivity: Radio—0.45v
Phono—4.5mv., adjustable with phono level control.
Max. Input Capability: Radio—10v for less than 1% IM dist.
Phono—150mv for less than 1% IM dist.
Max. Hum & Noise: Vol. control @ min., 90 db. below rated output.
Radio input (controls max.), 80 db. below rated output.
Phono input (controls flat), 60 db. below rated output (equivalent to 1½μv referred to input grid).
Power Consumption: 110-120v, 60 cps., 105 watts, fused. 1.5A
Tube Complement: (2)6L6GB, 12AU7A, (2) 12AX7, Z729, 5Y3GT, & pilot lite.
Size: 14 x 10½ x 4 in. high. Shipping weight: 23 lbs.



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SHERWOOD ELECTRONIC LABORATORIES, INC., CHICAGO 18, ILLINOIS

Price $.50

GENERAL INFORMATION

Your new Sherwood "Music Center" amplifier affords you with the fullest enjoyment possible in the field of true high fidelity. The S-1000 amplifier, though simple to operate, has many operating features permitting the utmost in listening pleasure in any situation. It is to your advantage to read through the entire instruction book carefully in order that you may best benefit from these features.

UNPACKING - After unpacking your amplifier, examine it carefully for indications of damage caused by shipping. If, for example, the cabinet has been dented or tubes broken, file a claim immediately with your carrier or dealer.

Enclosed with these instructions, are four mounting screws and washers and your warranty card. The warranty card explains Sherwood's one-year warranty against defects. It should be mailed immediately to fulfill warranty requirements.

INSTALLATION

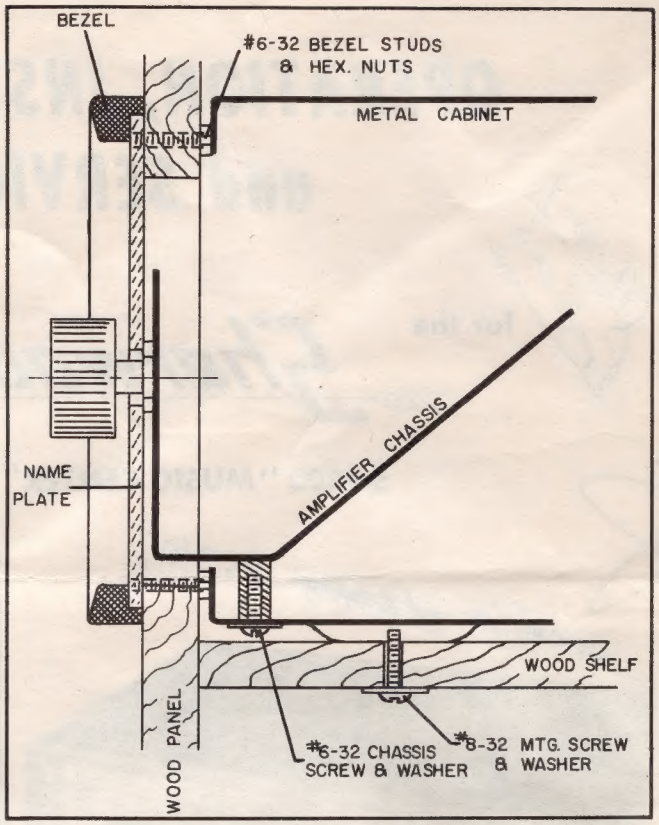
The S-1000 amplifier usually is placed so as to afford the greatest operating convenience -- on a chairside table, desk, bookshelf, or in a conventional radio cabinet. We recommend that the record changers or turntables be located within ten feet of your amplifier's input panel. The speaker, however, may be placed as far as 50 feet from your "Music Center" amplifier.

IMPORTANT - Allow at least 2 inches behind the rear of your amplifier for adequate ventilation and cabling convenience. Never place the unit near radiators or in front of heating vents. Excessive heat tends to shorten the life of the parts. (This is an important fact to remember in caring for all the elements of your high-fidelity system such as records and tape.)

PANEL MOUNTING - The S-1000 amplifier is a self-contained, self-cabineted unit which is easily adapted for panel mounting in custom cabinetry. The enclosed full-size mounting template and cross-sectional view shows details of such an installation.

Follow the instructions on the template for cutting the front panel holes as well as the access and ventilation holes on the mounting board. Never hang the amplifier from the front panel without a supporting mounting board or rails, cut as shown on the template.

CHASSIS DISASSEMBLY - 1. Remove the five front panel knobs with a steady outward pull. 2. Unscrew the four rubber mounting feet from the bottom of the cabinet. 3. Remove the four No. 6-32 chassis screws and washers located on the cabinet bottom. 4. The entire chassis can now be withdrawn from its cabinet through the rear opening. 5. Remove the polished metal bezel and nameplate from the cabinet front by unscrewing the four No. 6-32 nuts accessible from the inside of the cabinet.



Cross Section View of S-1000 Cabinet

REASSEMBLING ON PANEL - 1. Locate metal bezel and nameplate on cabinet panel front with studs extending through the 4 holes previously drilled. 2. From the rear of the panel, replace the four No. 6-32 nuts on bezel studs. 3. Replace chassis through the rear of its metal cabinet. 4. Replace the four No. 6-32 chassis screws through the bottom of the cabinet; tighten these screws with the chassis front extending beyond the front of the metal cabinet by an amount equal to your cabinet panel's thickness plus 1/8 in. You will notice that the chassis mounting-screw clearance holes in the bottom of the metal cabinet are elongated slots providing for panel thicknesses up to 1/2 in. 5. Slide the entire assembly into your cabinet from the rear so that the knob shafts are centered through the panel holes and the chassis front surface is tight against the rear of the nameplate. 6. Using the four No. 8-32 screws and washers supplied, secure the amplifier to mounting board. 7. Replace knobs.

ELECTRICAL CONNECTIONS

SPEAKER OUTPUTS - Examine your speaker system's nameplate to determine its rated impedance. Your speaker system will have two leads which are to be connected to your "Music Center" amplifier. Connect one of these leads to the terminal on the transformer of your amplifier which is marked with a number corresponding to the impedance of your speaker system (the transformer is accessible from the rear of the amplifier). Connect the second lead from your speaker system to terminal "G" of the transformer.

Plastic-covered lamp cord serves as excellent speaker connecting leads and may be extended as far as 50 ft. with little power loss. For shorter distances TV antenna lead can be used and is especially convenient for installation under a rug.

To add a remote speaker or to obtain a greater distribution of sound (psuedo-stereophonics), two speakers with the same impedance ratings may be used. In this case, connect one of each pair of speaker leads to "G" and the two remaining leads to the transformer terminal with a number equal to one-half of one of the speakers' rated impedance. It may be necessary to "phase" the two speakers by reversing both of the leads from one of the speakers.

PHONO INPUT - The shielded lead from your phono arm should be provided with a shielded "phono-type" plug which should be plugged into the amplifier jack labelled "Phono". To avoid loss in high-frequency response, it is recommended that this lead not exceed 10 ft. in length.

The phono input connection feeds the phono preamplifier and has been designed primarily for use with a magnetic or variable-reluctance (constant-velocity type) cartridge. The cartridge load is located directly across the phono input jack and is 47,000 ohms. This value correctly loads most pickups (such as the GE) for flat high-frequency response. Should a pickup be used where the manufacturer recommends a lower-valued load for flat response, install a resistor across the pickup terminals which, in parallel with 47,000 ohms, will result in the recommended load impedance.

Constant-amplitude type pickups (including crystal, ceramic, capacity, Weathers frequency-modulation) can be operated into the same phono input jack; however, the wire shorting the 47 μμf capacitor must be cut. For access to this shorting wire, remove the chassis from its cabinet (see preceding instructions on chassis disassembly). Cut the wire connected to the phono input jack (identified with red tape) and replace chassis.

TUNER INPUTS - Three high-level input jacks labelled "A", "B", and "C" are for use with radio tuners, TV receivers, and other equipment with at least 0.5v output. A shielded cable complete with a shielded "phono-type" plug should be used to connect each of these sources to your amplifier. Unless the source has a low-impedance output such as a cathode follower (with which up to 50 ft. of cable can be used), the shortest possible connection should be made to prevent loss of high-frequency response. All tuners should have volume controls to adjust their output voltage levels for correct operation of the loudness control in the S-1000. (See Listening to Tuners in Operation Section for further details.)

TAPE RECORDER INPUT and RECORDING OUTPUT - For all positions of the Selector switch, the Recording Output jack, accessible through the cabinet bottom opening, is a cathode-follower output jack which provides a flat response independent of the tone and loudness controls. With the Selector in the Tape position this jack is disconnected, preventing feedback through the recorder itself.

Recording connections are made with shielded cable (up to 50 ft. may be used) with a "phono-type" plug from the S-1000 Recording Output to the recorder's input. The playback connection is made with a similar cable from the recorder's output to the high-level input jack, marked Tape, on the S-1000 rear panel.

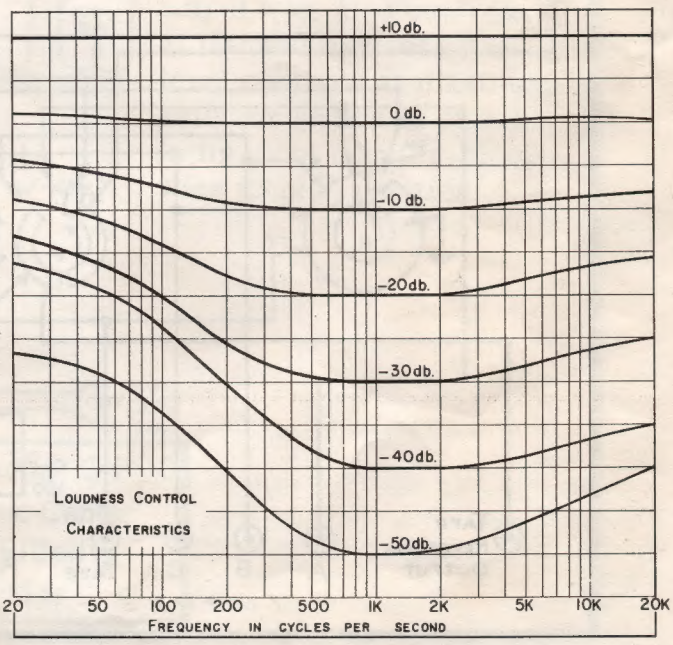
POWER CONNECTIONS - Plug the S-1000 line cord in to a wall outlet supplying 110-120 v., 60 cycle AC only. A phono changer or other equipment (consuming not more than 200 watts combined power,) may be plugged into the outlet on the rear of the amplifier. The power to this equipment is controlled by your amplifier's "on-off" switch.

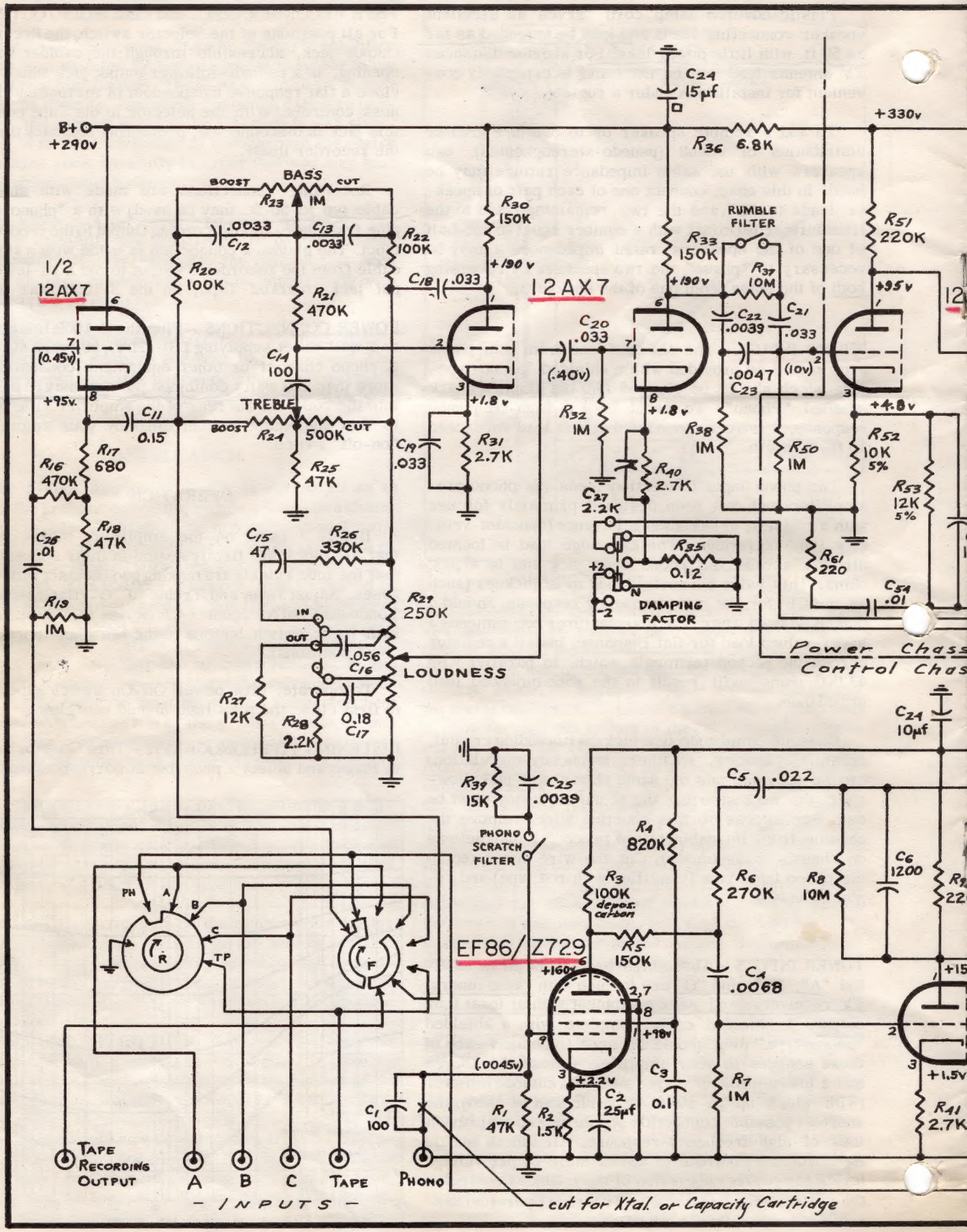
OPERATION

Before turning on the amplifier, make certain that all tubes are firmly seated in their sockets, and that the tube shields are making good contact with their bases. Adjust Bass and Treble to "O" (flat response), Loudness Control counter-clockwise to -75, and move both filter switch buttons to the left (their normal or "out" positions).

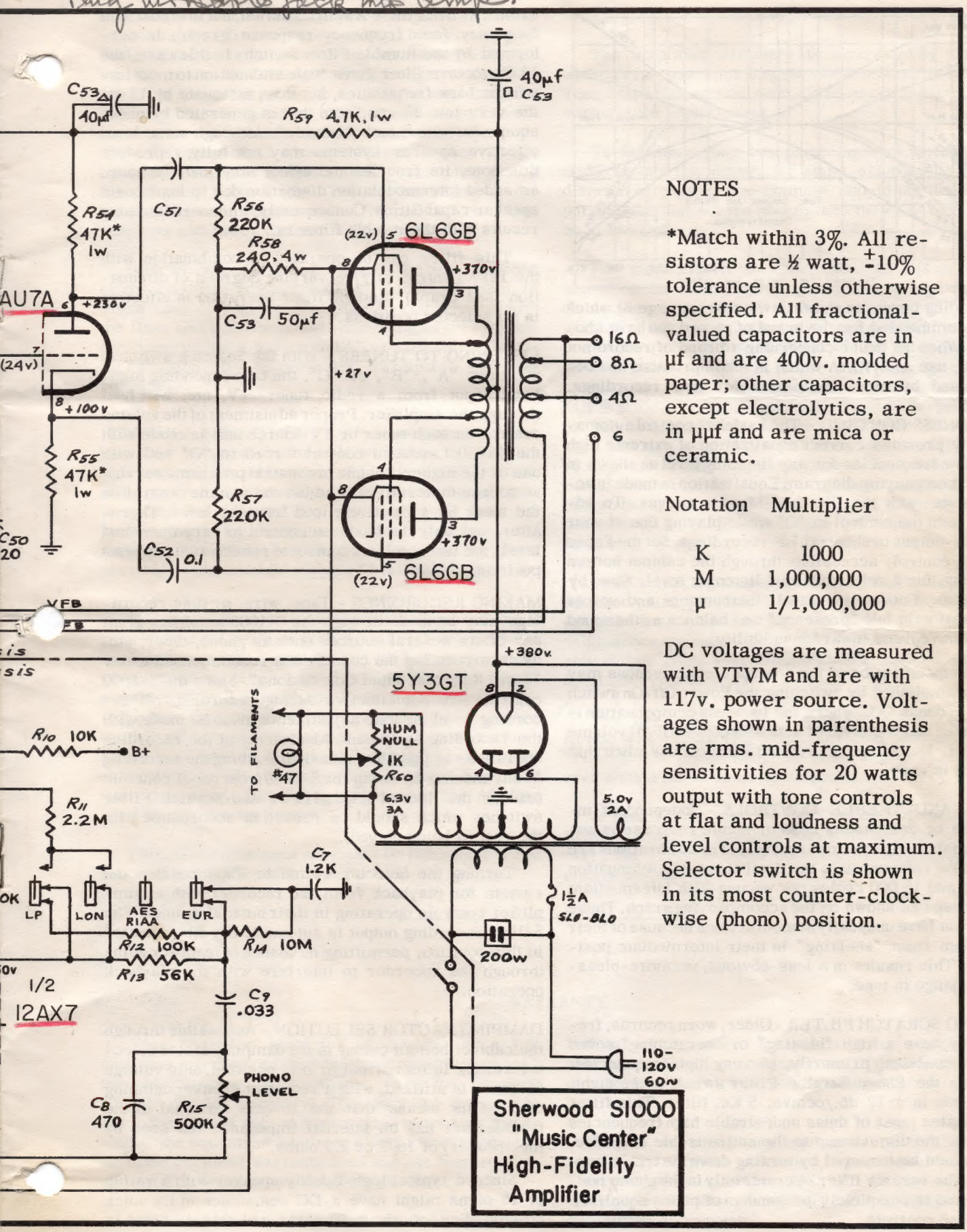
To operate, turn power Off-On switch clockwise to first click: the pilot light should now glow.

LISTENING TO PHONOGRAPH - Turn Selector switch to Phono and select a push-button corresponding to the




B+ +290v
C24 15µf
+330v
R36 6.8K
BASS
BOOST
CUT
R23 1M
.0033 C12
C13 .0033
R22 100K
R20 100K
R21 470K
C14 100
TREBLE
R24 500K
C11 0.15
R17 680
R16 470K
C26 .01
R18 47K
R19 1M
R25 47K
R30 150K
+190 v
C18 .033
+1.8 v
C19 .033
R31 2.7K
1/2 12AX7
(0.45v)
+95v.
C15 47
R26 330K
R29 250K
IN
OUT
.056 C16
LOUDNESS
R27 12K
R28 2.2K
0.18 C17
12AX7
C20 .033
(.40v)
R32 1M
R33 150K
+190v
RUMBLE FILTER
R37 10M
C22 .0039
C21 .033
.0047 C23
(10v)
+1.8 v
R38 1M
R40 2.7K
C27 2.2K
R35 0.12
DAMPING FACTOR
+95v
+4.8v
R50 1M
R51 220K
R52 10K 5%
R53 12K 5%
R61 220
C54 .01
Power Chass
Control Chas
C24 10µf
R39 15K
C25 .0039
PHONO SCRATCH FILTER
C5 .022
R4 820K
R3 100K deposit carbon
R6 270K
R8 10M
C6 1200
EF86/Z729
+160v
R5 150K
C4 .0068
2,7
8
9
1
+98v
(.0045v)
3
+2.2v
C2 25µf
C3 0.1
R7 1M
C1 100
R1 47K
R2 1.5K
R41 2.7K
+1.5v
PH
A
B
C
TP
R
F
TAPE RECORDING OUTPUT
A
B
C
TAPE
PHONO
- INPUTS -
cut for Xtal. or Capacity Cartridge

Plug turntable into bottom hole pre-amps.
Speaker wire to ⊥ of amp.
Plug turntable jack into amp.



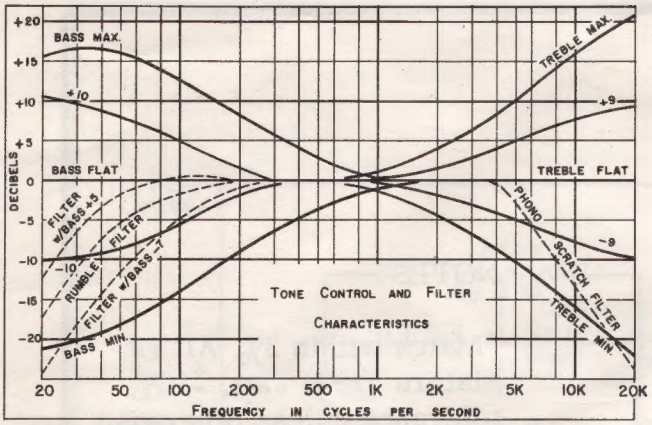
NOTES

*Match within 3%. All resistors are ½ watt, ±10% tolerance unless otherwise specified. All fractional-valued capacitors are in µf and are 400v. molded paper; other capacitors, except electrolytics, are in µµf and are mica or ceramic.

Notation	Multiplier
K	1000
M	1,000,000
µ	1/1,000,000

DC voltages are measured with VTVM and are with 117v. power source. Voltages shown in parenthesis are rms. mid-frequency sensitivities for 20 watts output with tone controls at flat and loudness and level controls at maximum. Selector switch is shown in its most counter-clockwise (phono) position.

Sherwood S1000 "Music Center" High-Fidelity Amplifier



recording curve (as shown on the chart on page 8) which is recommended for the brand of record you have chosen. When in doubt concerning a brand of record not listed, use AES/RIAA which is a compromise now being used by most companies for new recordings.

LOUDNESS CONTROL - The loudness control automatically provides correct equalization of extreme high and low frequencies for any listening level as shown in the accompanying diagram. Equalization is made in accordance with the Fletcher-Munsen curves. To adjust, turn the control to "O" while playing one of your higher-output orchestral LP recordings. Set the Phono Level control, accessible through the cabinet bottom opening, for a relatively loud listening level. Now, by using the Loudness control, instruments and voices will maintain full "presence" and balance as the sound level is reduced toward inaudibility.

Demonstration of the control's effectiveness may be accomplished by switching the Power Off-On switch to "Loudness Off" where the loudness compensation is removed and the control acts as a conventional volume control. No change in volume level occurs when this switch is used.

BASS AND TREBLE CONTROLS - Independent increase or decrease of bass or treble response is accomplished with the tone controls. The calibrations are accurate references to the decibel boost or attenuation at 30 and 15,000 cycles per second with intermediate responses as shown on the accompanying graph. These controls have unusually smooth actions because of their freedom from "shelving" in their intermediate positions. This results in a less-obvious, yet more-pleasing, change in tone.

PHONO SCRATCH FILTER - Older, worn records, frequently have a high "hissing" or "scratching" sound which consists, primarily, of very high frequencies. Moving the Phono Scratch Filter switch to the right, switches in a 12 db./octave, 5 Kc. filter. This filter eliminates most of these undesirable high frequencies without the disturbance to the entire treble response, that would be incurred by turning down the treble control. The scratch filter operates only in the phono position and is completely independent of phono equalizer and tone controls.

RUMBLE FILTER - A similar action, but inverted with frequency (see frequency-response graph), is performed by the Rumble Filter switch. In this case, the 12 db./octave filter gives little attenuation to most important bass frequencies, but does attenuate by 12 db. the very low 27-cps. note that is generated by phono equipment with motor "rumble". Although some less-effective speaker systems may not fully reproduce this note, its troublesome effect may still be heard as added intermodulation distortion due to inadequate speaker capabilities. Consequently, improved listening results with the rumble filter in.

This filter can be operated in combination with the bass control to give varying degrees of attenuation (see graph). Rumble filter operation is effective in all selector positions.

LISTENING TO TUNERS - With the Selector switch in positions "A", "B", or "C", the corresponding high-level input from a radio tuner, TV, etc. will feed through the amplifier. Proper adjustment of the volume control on each tuner or TV source unit is made with the S1000 Loudness control turned to "O" and with one of the higher-volume orchestral programs serving as source material. Now adjust the volume control on the tuner for a relatively loud listening level. Thereafter, use only the loudness control to vary the sound level, the tuner volume control to remain at its preset position.

MAKING RECORDINGS - Tape, wire, or disc recordings may be made through the S-1000 amplifier from any of its several sources such as phono, tuner, etc. by incorporating the connections recommended under "Tape Recorder Input Connections". Since the S-1000 controls are not effective during recording, all recording level or tone adjustments must be made with the recording equipment. Monitoring of the recording operations is possible without disturbing the recording in any manner by using the S-1000 front panel controls (except the Record Equalizer and Scratch Filter switches which should be preset in accordance with the record being played).

Turning the Selector switch to Tape readies the system for playback from the recorder with all amplifier controls operating in their normal manner. The S-1000 recording output is automatically disconnected in this position, permitting no chance of feedback going through the recorder to interfere with the playback operation.

DAMPING FACTOR SELECTION - Accessible through the cabinet bottom cutout is the damping-factor selector switch. In its normal or mid position, only voltage feedback is utilized, with a resultant speaker damping of 7. This means that the 16-ohm terminal of the transformer has an internal impedance (as seen by the speaker) of 16/7 or 2.3 ohms.

Since a typical high-fidelity speaker with a rating of 16 ohms might have a DC resistance in its voice coil winding of about 10 ohms and this 10 ohms is

effectively in series with the voice coil, further lowering of the amplifier output impedance by increasing its damping factor is to no avail, unless a negative damping factor can be developed. Such a negative damping factor is available with the S-1000 by switching the Damping-Factor Selector to -2 where current feedback from the speaker is added to the voltage feedback. Damping of -2 means that the 16-ohm tap appears as a negative 8 ohms to the speaker, increasing its damping accordingly. The improvement in the speaker system operation lies in reduced transient hangover and lower distortion.

Such increased damping reduces the bass response at the resonant frequency of the speaker system, in which case it may be desirable to compensate with the Bass control. Where well-damped speaker systems are being utilized, the normal +7, or even the +2 damping position may be preferred to improve the bass response.

HUM NULL ADJUSTMENT - After your new amplifier has been in operation for at least 1 hour, it is advisable to check the adjustment of the Hum-Null Control. This control is accessible at the rear of the cabinet. It should be adjusted for minimum hum from the speaker with the Selector on Phono, Loudness and Bass at maximum, Rumble Filter out, and the phono cartridge connected by without the turntable operating.

If a magnetic-type cartridge is being used and if it is suspected of hum pickup, a check can be made by substituting the cartridge and its lead with a short circuited phono plug inserted into the phono input jack. Repeat hum-null adjustment. Reducing magnetic cartridge hum can sometimes be accomplished by moving the record player with respect to nearby power transformers or motors. Also check for a single good ground connection to the turntable frame, phono arm, and cartridge case. Finally try reversing the AC line card plug in the wall outlet.

Hum-null adjustment may also be necessary if the phono-preamplifier tube is replaced.

② 12AX7 (tone)
① 12AU7A (vol)
② 6L6GB, matched
① 5V8GT (power)
① EF86 = Z729

SERVICING

The amplifier circuitry is exceptionally stable, using parts noted for longest life wherever possible. Your amplifier should need little service except for normal tube replacement.

To facilitate your own servicing when necessary, try to isolate the inoperative stage, aided by the block diagram on page 2. For example, should the tuner input operate, but not the phono; then the Z729 tube may be suspected, etc.

For more elusive troubles, check the DC voltages shown on the schematic diagram with a high-impedance voltmeter. To check the operation still more carefully, AC mid-frequency voltage sensitivities are shown in parenthesis at most of the grids for full 20-watt power output.

TUBE SUBSTITUTION - 6L6GB's have been specified for use as output tubes. Where replacement is necessary and this type is not available, either the 6L6GA or 6L6 metal tube may be used as substitutes. These tubes, however, do not have the advantages of the button base, etc., associated with the more recently designed 6L6GB. The premium 5881 tube also may be used.

When replacing output tubes, it is desirable to use matched pairs of tubes to facilitate low distortion and optimum bass response. Matched tubes, such as those originally supplied in the S-1000 Amplifier, are available either from your High Fidelity Supplier or the S.E.L. Service Dept.

The low noise Z729 tube is replaceable by the EF86. With either type, the individual tube used influences the phono hum and noise level. Therefore care should be taken in its selection.

A 12AU7 tube may be used instead of the newer 12AU7A which is supplied with your amplifier. However, the 12AU7A has a construction less subject to microphonics.

WARRANTY

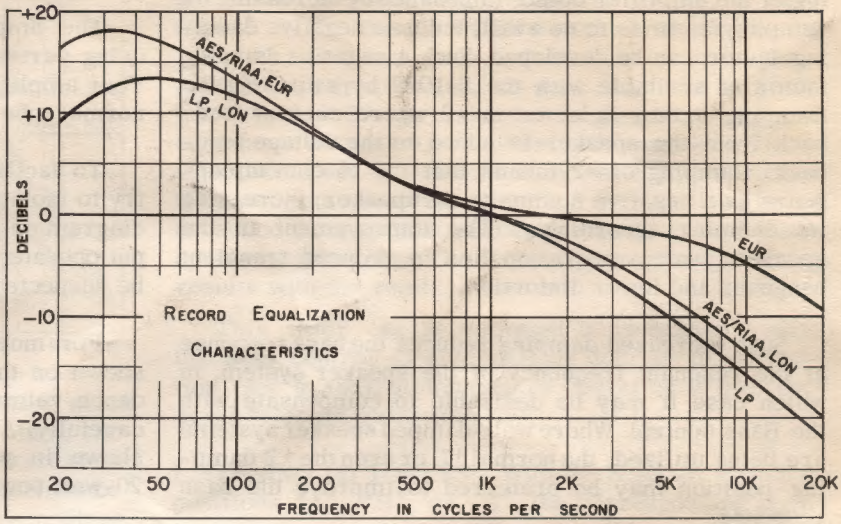
Your Sherwood amplifier is covered by a full one-year warranty against defective material or workmanship (except tubes which carry the standard RETMA 90-day warranty). This warranty is effective from the date of sale to the original purchaser and is void if the equipment has been altered in any manner, or if the enclosed warranty card has not been returned to S.E.L. within ten days from purchase.

S.E.L. maintains a complete service department and laboratory where equipment of its manufacture will be repaired at nominal rates. To avoid shipping delays, local service is usually advisable.

Before returning any equipment to S.E.L. for repair, please write to Service Department, Sherwood Electronic Laboratories, 2802 W. Cullom Avenue, Chicago 18, Illinois, giving full details of any operating difficulties encountered.

SUGGESTED PHONO EQUALIZER SETTINGS FOR VARIOUS RECORD BRANDS

Records are made with the treble range boosted (to mask surface noise) and the bass range attenuated (to reduce distortion). Therefore, a corresponding, but-inverted, response curve must be used in playing each record. However, all records are not made with the same curve. The nearest correct equalization setting is tabulated in the chart below for most record brands. For brands not appearing here, use the AES/RIAA equalization position which is a compromise curve recently adopted by most recording companies. The frequency response for each record equalization curve is shown on the graph at the right.



Record Label	Equalization	Since Spring 1954
Allied	AES/RIAA	AES/RIAA
Angel	AES/RIAA	AES/RIAA
Atlantic	LP, Bass +5 *	AES/RIAA
Amer. Rec. Soc.	AES/RIAA	AES/RIAA
Bartok	LP, Bass +5	no change
Blue Note Jazz	AES/RIAA, -Bass +2	AES/RIAA
Boston	LP	AES/RIAA
Caedmon	AES/RIAA	AES/RIAA
Camden	AES/RIAA	AES/RIAA
Canyon	AES/RIAA, Bass +2	AES/RIAA
Capitol	AES/RIAA, Bass +2	AES/RIAA
Capitol-Cetra	AES/RIAA, Bass +2	no change
Cetra-Soria	LP	no change
Colosseum	LP	AES/RIAA
Columbia	LP	AES/RIAA
Concert Hall	AES/RIAA, Bass +2	AES/RIAA
Contemporary	AES/RIAA, Bass +2	AES/RIAA
Cook	AES/RIAA, *	AES/RIAA
Decca	LP	AES/RIAA
EMS	AES/RIAA, Bass +2	AES/RIAA
Elektra	LP, Bass +5	no change
Epic	LP	AES/RIAA
Esoteric	AES/RIAA	AES/RIAA
Folkways (most)	LP, Bass +5	no change
Good-Time Jazz	AES/RIAA, Bass +2	AES/RIAA
Haydn Society	LP	AES/RIAA

Record Label	Equalization	Since Spring 1954
L'Oiseau-Lyre	LON	AES/RIAA
London (ffrr)	LON	AES/RIAA
Lyrichord, old	LP or AES/RIAA	AES/RIAA
new	LP, Bass +5	AES/RIAA
Mercury	AES/RIAA, Bass +2	AES/RIAA
MGM	AES/RIAA	AES/RIAA
Oceanic	LP, Bass +5	AES/RIAA
Pacific Jazz	AES/RIAA	AES/RIAA
Philharmonic	AES/RIAA, Bass +2	AES/RIAA
Polymusic	LP, Bass +5 *	AES/RIAA
RCA Victor	AES/RIAA, Bass +8	AES/RIAA
Remington	LP, Bass +5	AES/RIAA
Riverside	AES/RIAA	AES/RIAA
Romany	AES/RIAA	AES/RIAA
Savoy	AES/RIAA	AES/RIAA
Tempo	AES/RIAA	AES/RIAA
Urania, most	LP, Bass +5	AES/RIAA
some	AES/RIAA, Bass +5	AES/RIAA
Vanguard	LP	AES/RIAA
Bach Guild	LP	AES/RIAA
Vox	LP	AES/RIAA
Walden	AES/RIAA	AES/RIAA
Westminster	LP, Bass +5	no change
European 78's & Older Amer. 78's	EUR, also boost bass & treble, poor records need scratch & rumble filter in.	

* except use EUR for binaural, inside band only

(Powers)